OOCEA SR-417
SR-528 to Curry Ford Road

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Tony Rodgers

- ➤ Director of Field Engineering Hubbard
- ➤ 30 Plus years Heavy Highway construction
- ➤ Primarily Layout and Survey Related support

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Project
OOCEA SR-417

➢ 3.8 miles Roadway and Shoulder widening

➢ > 16 lane miles of Mill & Resurface

➢ Bridge Widening

➢ $18.9 million Total Contract amount

➢ $2.5 million Asphalt Contract amount

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Milling and Resurfacing
Objective

➢ Correct Cross Slope to, 2% Inside lane & 3% Outside lanes

➢ Correct Profile to design template

➢ Use OOCEA new specification for laser augmented GPS Machine Control due to complex correction plan

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Plan of Attack

➤ Recover and verify the plan Horizontal and Vertical Control
➤ Set Horizontal & Vertical Control for MM GPS Topo work
➤ Verify existing Roadway Profile
➤ Build Digital Terrain Model (DTM)

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Existing Roadway Verification

➤ Found Existing Profile 0.0' to 0.5' different than existing shown in plans
➤ Determined we needed new existing data
➤ Decided to collect new data on existing lane lines @ 25' intervals using MMGPS
➤ Provided data to design firm for redesign

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Implementation of MMGPS to Milling and Paving

Prework Requirements

- Set Control @ acceptable intervals,<= 900' Transmitters no more than 1800' apart
- Have control in SAFE accessible locations where elevated truck beds and passing trucks would not obscure transmitting signal from Laser
- Install MMGPS equipment on Milling & Paving Equipment
- Train Milling and Paving crews on use of MMGPS equipment

Additional Support to Milling and Paving operation

➢ Expected 2 to 3 days hands on training
➢ Expected 1 survey personnel for duration of Milling and Paving operation
➢ Expected Milling and Paving personnel to be able to maintain and move lasers.

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Actual Support

➢ 3 man Survey Crew & 1 Topcon equipment Rep during duration of Milling and Paving of inside lanes
➢ Survey Crew maintained & moved equipment as well as collecting As-Built Data

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Milling and Paving Process

- ➢ 1) Identified Overbuild areas throughout project
- ➢ 2) Milled required minimum depth (friction) in Overbuild areas
- ➢ 3) (MMGPS on Paver) applied over build to .04' above bottom of planed mill depth
- ➢ 4) ***Inside Lane corrections*** (MMGPS on Mill) Milled to bottom of proposed structural course
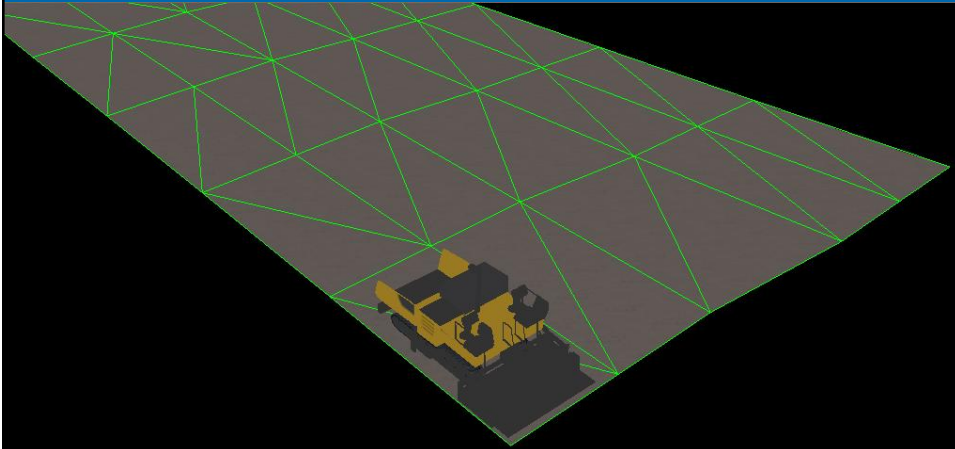- ➢ 5) As-built milled surface using MMGPS Survey Rover

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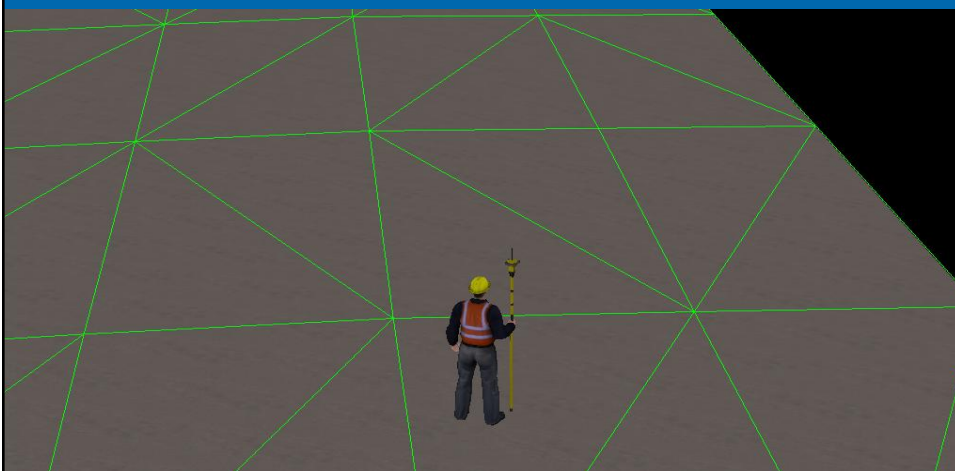# Milling and Paving Process

- ➢ 6) Paved depth over milled surface
- ➢ 7) As-Built behind Paver
- ➢ 8) ***Adjacent Lane corrections*** (GPS only, on Mill) milled depth and cross slope using first lane for grade utilizing joint match sensors.

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Milling and Paving Process

Milling and Paving Process

Requirements at
Paver and Milling Machine

- Insure all Laser transmitter control points are in Project file
- Monitor screen for loss of GPS signal
- Monitor screen for loss of Laser signal
- Monitor that correct Delta to the design surface is set
- Occasional check with Survey rover for accuracies

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Requirments at
Laser Transmitters

- Set up Transmitters on control points
- Insure correct point is selected
- Bench out Laser to another control point
- Keep Transmitters (maximum of 4 covering 6,000 to 7000 feet) properly positioned behind and ahead of Milling and Paving operation

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Outcome

- Paving and Milling crews were impressed and pleased with results
- CEI and Owner were pleased with results
- Proposed Asphalt quantities achieved
- Average Delta to design grade .01'

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Tony's Opinion "Cons"

- 1) Support from Survey side was very labor intensive both preliminarily and during paving, although support during paving will likely decrease as all involved become more familiar with operation & better procedures are developed
- 2) Increased up front cost both Labor and Equipment
- 3) No noticeable production increases in asphalt placement.

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Tony's Opinion
"Pros"

➢ 1)Much more accurate than alternative methods

➢ 2) No intermediate survey of surface required between asphalt lifts

➢ 3) Control quantities, if existing data is accurate.

➢ 4) Improved riding surface.

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